

# New Isoptera from Belgian Congo. (With redescriptions of some named species).

by

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## 1. INTRODUCTION.

When associating new material with a species already named it would appear to be sound policy for a worker in the Isopteran field not merely to publish the new locality record, but also to give a description of the material, should there be any deviation from the original and subsequent descriptions of the species. Should this be done the original description will continually be broadened until it eventually embraces the limits of variation of the species. This is a time-consuming and thankless task, but a valuable and positive contribution towards complete understanding of the taxonomy of the Order.

In this report seven series of termites from the Belgian Congo are specifically determined, one *Glyptotermes* and two *Neotermes* species being described as new. A description is given of four series referred to species already named, the synonymy and recorded distribution being reviewed in each case.

The writer is indebted to Prof. Alfred E. Emerson for comparing with the Types the material herein referred to the species *Thoracotermes macrothorax* Sjöst. and *Noditermes cristifrons* Wasm. The opinions expressed by him are quoted in the text.

In the descriptions given below all dimensions are in millimetres. In listing locality records for the various species, as far as possible the collector's name is given in parenthesis.

## 2. DESCRIPTION OF SPECIES.

### (i) *Neotermes aburiensis* Sjöstedt.

1926, Sjöstedt, Y.: *K. Svenska Vetensk. Akad. Handl.*, Ser. 3, Vol. 3, No. 1, p. 39, soldier, Gold Coast (Aburi), *Neotermes aburiensis*.

1937, Grassé, P. P.: *Ann. Soc. Ent. France*, Vol. 106, Pt. I, p. 10, imago, soldier, Ivory Coast (Bingerville), *Neotermes aburiensis*.

1949. Snyder, T. E.: *Smithsonian Misc. Coll.*, Vol. 112, Publ. 3953, p. 21, synonymy, *Neotermes aburiensis*.

To this species have been referred four soldiers and nymphs. The detailed description of the soldier given below corresponds with the very sketchy diagnosis given by Sjöstedt, and agrees in most respects with the description and figures of Grassé.

*Soldier* (Fig. I, D—H).

Viewed from above, the head is brown-yellow with darker antennal carinae. Postclypeal area brown-yellow, anteclypeus white, labrum brown-yellow. Mandibles dark yellow-brown at bases, thereafter shining black. Antennae pale yellow-brown proximally, fading to cream-yellow distally. Compound eyes and ocelli vestigial, white. Gula brown-yellow, bordered on either side by a pale brown band. Pronotum cream-yellow at the sides, brown-yellow in the middle, the anterior margin thinly edged with brown. The remaining thoracic segments and tergites a pale cream-yellow, the sternites cream. Femora cream, tibiae and tarsi cream-yellow, the tibial apical spines and tarsal claws dark brown.

Head, thorax and abdomen sparsely bristled. In dorsal perspective the head is elongate rectangular, the sides straight and parallel or faintly concave in the middle, the postero-lateral corners broadly rounded. Epicranial and transverse sutures distinct, the clypeo-frontal suture represented by a transverse depression. Ocelli minute spots, rudimentary but distinct. Compound eyes oval, unpigmented and rudimentary. Frons depressed medially, bordered behind by a distinct, concavely curved ridge; when viewed from the side, the frons slopes downwards from vertex to the level of the mandibles at an approximate angle of  $30^\circ$ . Anteclypeus with straight sides converging distally and a slightly concave anterior margin. Labrum with straight, slightly diverging sides rounded into a straight anterior margin which is slightly humped in the middle; a few bristles on or near the anterior margin.

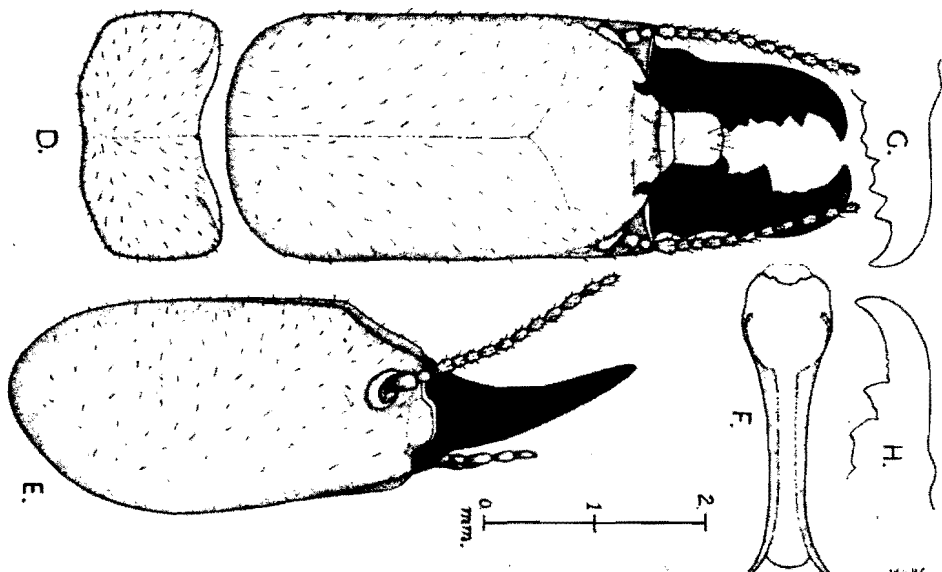
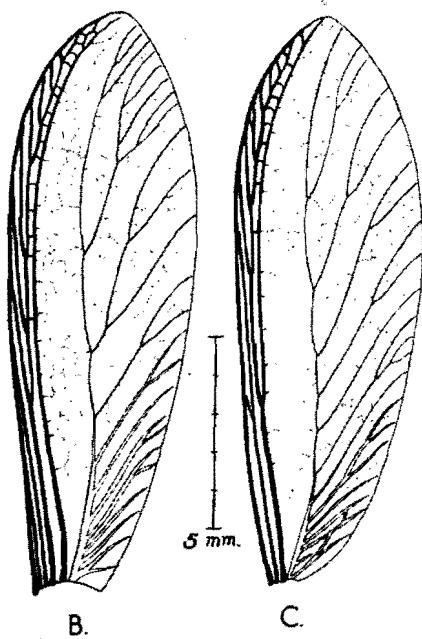
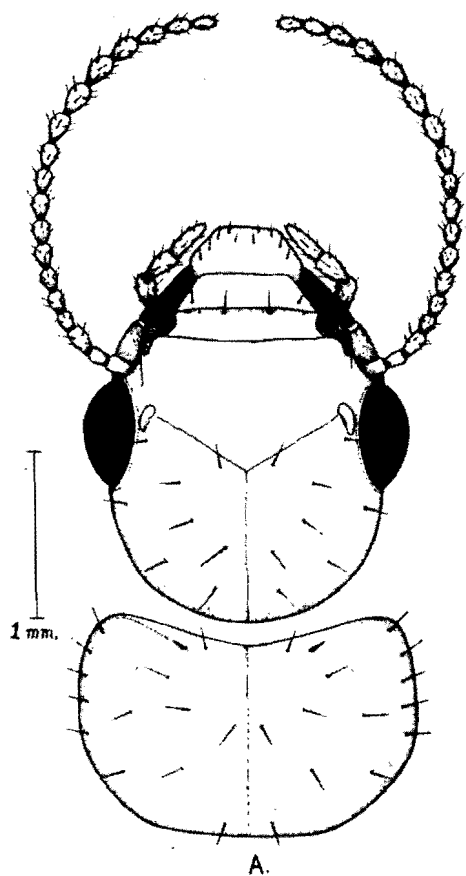
Mandibles stout, up-curved towards the tip when seen from the side; viewed from above, the mandibles are humped near their outer bases, the sides thereafter becoming progressively incurved towards the tips. Right mandible with two prominent marginal teeth; I step-like, placed approximately at mid-length, with indications of a minor second point near its proximal end; the cutting margin distal to tooth I slightly serrate, with 3 or 4 minor points; II bracket-shaped, with a slight backwardly-directed point at approximately mid-length. Left mandible with 3 distinct marginal teeth; I acute-angled and narrow-based; II wide-based, with a distinct point near its distal end and

Fig. 1. *Neotermes collarti* sp. nov.

Imago: A - head and pronotum, dorsal aspect; B - forewing; C - hindwing.

*Neotermes aburiensis* Sjöst.

Soldier: D - head and pronotum, dorsal aspect; E - head, lateral aspect; F - gula; G - left mandible; H - right mandible.



a less distinct point near the sharp notch separating it from III; III wide-based, bracket-like, with a minor point near its distal end, and a more prominent point just distal to mid-length.

Antennae with from 13—17 articles (of 8 examined 2 were incomplete, 2 had 13 articles, 1 had 14, 2 had 15, and 1 had 17 articles); article II ranging from about half the length of clavate III in the expression with 13 articles, to only slightly shorter than the not nearly so clavate III in the expression with 17 articles; IV and V sub-equal, as long as or slightly shorter than II.

Pronotum arched transversely, as wide as, somewhat wider or narrower than the head (2.33 cf. 2.33; 2.33 cf. 2.31; 2.19 cf. 2.29; 2.17 cf. 2.21); length along the mid-line slightly more or less than half the width (1.04 cf. 2.33; 1.17 cf. 2.19; 1.04 cf. 2.33; 1.00 cf. 2.17); anterior margin concave, antero-lateral corners sub-rectangular, broadly rounded; sides only slightly convex, obtusely rounded into a three-faceted hind margin, the middle facet of which is slightly concave. Meso- and metanotum with rudimentary wing-buds; their hind margins only slightly concave in the middle.

Tibial apical spines number 3 each on fore-, mid- and hindleg. Cerci short. Styli present on all four soldiers examined.

In Table I, the dimensions and antennae of the four soldiers from the Belgian Congo, described above, are compared with the Gold Coast and Ivory Coast series as described by Sjöstedt and Grassé respectively.

	Belgian Congo	Gold Coast	Ivory Coast
Total length	11.4 — 12.7, av. 12.1	—	12.0
Head plus mandible	5.04 — 5.71, av. 5.50	5.4 — 6.0	4.6 — 4.7
Head width	2.21 — 2.33, av. 2.28	2.0 — 2.3	2.0
Left mandible length	1.92 — 2.04, av. 1.97	—	—
Length of pronotum	1.00 — 1.17, av. 1.06	—	—
Width of pronotum	2.17 — 2.33, av. 2.27	—	—
Antenna	13 — 17 articles	13 articles	13 articles

TABLE I.

*N. aburiensis*: Comparison of described soldiers.

It will be noticed that in the length of the head including the mandibles, the soldiers from Belgian Congo (5.04—5.71) agree more closely with the Type series from the Gold Coast (5.4—6.0) than do the Ivory Coast series measured by Grassé (4.6—4.7).

#### *Distribution:*

Gold Coast: Aburi (Patterson), Type locality; Ivory Coast: Bingerville (Grassé); Belgian Congo: Forêt de Kawa, Lake Albert (Collart).

*Material Studied:*

Series Terv. 87 A: Coll. Collart, 12. iv. 1929, Forêt de Kawa, Lake Albert, Belgian Congo. Four soldiers and nymphs, divided between the Belgian Congo Mus., Tervuren, and the Division of Entomology Collection, Pretoria.

**(ii) *Neotermes collarti* sp. nov.**

Included in the termite series received from the Museum Tervuren is a vial containing a single winged imago belonging to the genus *Neotermes*. This was collected by Collart from the same general locality in the Belgian Congo as the series Terv. 87 A, and it was at first thought likely that this too would be *N. aburiensis* Sjöst. Grassé (1937) gives a description of the imago of *N. aburiensis*, taken with soldiers in a nest series from the Ivory Coast. As will be shown below, this unique alate from the Congo differs from his description in several respects, and it is here described as a new species.

*Imago* (Fig. I, A—C).

Head dark brown, much darker than and contrasting in colour with the rest of the body. Compound eyes black, ocelli white. Anteclypeus white. Labrum golden yellow, antennae brown-yellow. Pronotum brown-yellow. Meso- and metanotum cream-yellow in front darkening to brown-yellow behind, each with a black median line commencing at the anterior margin and fading away at about three quarter the distance to the posterior margin. Tergites yellow-brown, sternites a paler brown-yellow. Femora yellow, tibiae dark brown with darker apical spines. Tarsi a paler brown than the tibiae, with tarsal claws tipped dark brown. Wing membrane tinged a faint brown; all ribs from the costal margin up to and including the median dark brown, the cubitus unpigmented.

Head and body sparsely covered with stiff bristles. Epicranial, transverse and clypeo-frontal sutures distinct. Head in dorsal outline semi-circular behind the eyes. Ocelli sub-oval, in contact with the upper rims of the eyes, longest diameter 0.27. Compound eyes well developed, in dorsal perspective bulging well beyond the outline of the head; sub-circular in outline with flattened anterior margin, longest diameter 0.62. Postclypeus short and wide. Anteclypeus with straight sides converging distally; antero-lateral corners obtuse-angled and rounded into a straight anterior margin. Labrum with diverging sides rounded into an anterior margin with 3 facets. Antenna with 18 articles; I longer than II, III sub-clavate, distinctly longer than II and IV.

Pronotum reniform, arched transversely, wider than the width of the head including the eyes (2.10 cf. 1.95); length along the mid-line somewhat more than half width (1.17 cf. 2.10); anterior margin concave, antero-lateral corners broadly rounded, sides somewhat convex and two-facetted, postero-lateral corners obtuse angled and broadly rounded into a straight hind margin. Hind margin of mesonotum nearly straight, that of the metanotum shallowly but distinctly concave in the middle.

Wing membrane reticulated; all ribs from the costa up to and including the median well developed and chitinised, the cubitus weak and rudimentary except at the base; the median runs close and parallel to the radius sector, to which it is connected by a number of short struts. Forewing with all ribs arising independently at the suture; subcosta short, simple; radius unbranched, joining the costal margin in the proximal half of the wing; radius sector with 7 or 8 simple or forked offshoots proceeding to the costal margin; median simple, running to the wing tip; cubitus with a variable number of simple or forked offshoots to the inner margin of the wing, distinct near the suture but rudimentary in the distal half of the wing. Hindwing with the radius and cubitus arising independently at the suture, the radius sector and median with a common stem up to the proximal third of the wing; subcosta lacking; radius long, joining the costal margin in the distal half of the wing, simple or with 1 offshoot to the costal margin; radius sector with 7 to 9 simple or forked offshoots to the costal margin; median simple, running to the wing tip; cubitus with numerous simple or forked offshoots to the inner margin of the wing, the proximal ones more distinct than those in the distal two thirds of the wing.

Tibial apical spines number 3 each on the fore-, mid-, and hindleg. Cerci short, styli lacking. Pulvilli present.

Measurements (one female only): Length including the folded wings 21.1; length without wings 11.8; wingspan 35.4; length of forewing to the suture 15.5—15.7; width of forewing 4.62—4.66; head width including the eyes 1.95; diameter of eyes 0.62; pronotum length along the midline 1.17; pronotum width 2.10.

*Relationship.*

In Table 2 the dimensions of *N. collarti* are compared with those of *N. aburiensis* Sjöst. (*vide* Grassé, 1937, pp. 10—12) and *N. gestri* Silv. (*vide* Silvestri, 1912, pp. 3—6).

	<i>N. aburiensis</i>	<i>N. collarti</i>	<i>N. gestri</i>
Length of forewing	11.75	15.5 —15.7	14.9 —15.1
Width of forewing	3.5	4.62— 4.66	4.0 — 4.2
Length with wings	14.5	21.1	17.5 —19
Length without wings	8.75	11.8	9.5 —10.0
Head width	1.6—1.65	1.95	1.43— 1.62
Diameter of eyes	—	0.62	0.60— 0.65

TABLE 2.

Comparison of imago: *N. aburiensis*, *N. collarti*, *N. gestri*.

The imago of *N. aburiensis* is distinctly smaller than that of *N. collarti*. The imago of *collarti* is near that of *N. gestri*, which it resembles in general

description and dimensions; with the possible collection of intergrading material, *N. collarti* may in future prove to be the same species as *N. gestri*. On the basis of data available at present, *N. collarti* has a wider head and is in general the larger insect. Although in the diameter of the eye the imagos of these two species correspond, judging by the drawing given by Silvestri (1912, p. 4, Fig. I (1)), the compound eyes of *N. gestri* do not bulge beyond the outline of the head in dorsal perspective as much as they do in the case of *N. collarti*.

The imago of *N. laticollis* Hgrn. is also somewhat smaller, and can readily be distinguished from *N. collarti* by its head, which is of a paler yellow-red instead of dark brown, and by the fact that the radius sector and median of the hindwing unite much nearer to the wing suture. *N. nigeriensis* Sjöstr. has a distinctly narrower forewing (4.0 cf. 4.6).

*Distribution:*

Belgian Congo: Forêt de Kawa (Collart). Type locality.

*Material studied:*

Series Terv. 206: Holotype female winged imago, collected Collart, 2. iv. 1929, Ituri, Forêt de Kawa, Belgian Congo; lodged with the Belgian Congo Museum, Tervuren.

(iii) ***Neotermes lepersoneae* sp. nov.**

*Imago* (Fig. 2, B—F).

Head brown with paler yellow-brown frons and postclypeus, anteclypeus white. Labrum and antennae brown-yellow. Eyes black, ocelli white. Pronotum brown-yellow, somewhat paler than the head, edged with darker yellow-brown along the anterior margin. Meso- and metanotum cream-yellow in front, darker brown-yellow behind, each with a black median stripe commencing at the anterior margin and tapering away to disappear entirely three quarters of the way to the hind margin. Tergites golden brown, sternites much paler. Femora cream-yellow, tibiae slightly darker brown-yellow, tibial apical spines and tips of tarsal claws dark brown. Membrane of the wings tinged pale brown, all ribs up to and including the median dark brown, the cubitus unpigmented.

Head, thorax and abdomen sparsely covered with stiff bristles. Seen from above the outline of the head behind the eyes is semicircular. Epicranial, transverse and clypeo-frontal sutures distinct. Ocelli large, sub-oval, in contact with the upper rims of the eyes, long diameter 0.27—0.29. Compound eyes sub-circular in outline with a somewhat straightened anterior margin, diameter 0.6—0.7. Frons somewhat depressed medially, with more or less distinct „V” shaped marking. Postclypeus with flatly concave posterior and a nearly straight, slightly convex anterior margin. Anteclypeus with straight sides converging distally, antero-lateral corners obtusely angled, anterior margin straight but slightly humped in the middle. Labrum with diverging sides,

broadly rounded into a convex anterior margin; bristled in the distal half.

Left mandible with 2 marginal teeth; I separated from II by a sharp incision, II directed backwards with the point at its proximal end. Right mandible with 2 marginal teeth, I narrow-based and acute, II wide-based with its point at the distal end. Antenna with 17—20 articles (of 40 examined, 27.5 % were incomplete, 5 % had 17 articles, 30 % had 18, 35 % had 19 and 2.5 % had 20 articles); in the usual expressions with 18—19 articles, II slightly longer than or approximately as long as III, III slightly longer than IV.

Pronotum arched transversely with flatly concave anterior margin, broadly rounded antero-lateral corners, sides convex and usually with 2 facets, postero-lateral corners very broadly and obtusely rounded, hind margin only very slightly concave; pronotum distinctly wider than the head including the eyes (average for 20 specimens 2.43 and 2.21 respectively); about twice as wide as long in the middle (average for 20 specimens 2.43 and 1.20 respectively). Hind margins of meso- and metanotum slightly concave in the middle.

Wing membrane reticulated; all ribs from the costa up to and including the median well developed and chitinised, the cubitus weak, unchitinised; the median running close and parallel to the radius sector, to which it is connected by a number of short struts. Forewing with all ribs arising independently at the suture; subcosta short and simple; radius simple; radius sector with from 8 to 11 oblique offshoots to the costal margin, the distal ones short and confused by reticulation; median simple, or forked right at the wingtip; cubitus with a large and variable number of simple or forked offshoots to the inner margin of the wing. Hindwing with radius and cubitus arising independently at the suture, the radius sector and median with a common stem in the first third of the wing; subcosta lacking; radius long and simple; radius sector with a variable number, usually about 8, simple or forked offshoots to the costal margin, the distal ones short and confused by reticulation; median simple or forked near the wingtip; cubitus with a large and variable number of simple or forked offshoots to the inner margin of the wing.

Tibial apical spines number 3 each on fore-, mid- and hindleg. Cerci short. Styli present in the male and lacking in the female. Pulvilli present.

Measurements (9 females and 11 males): Length including wings 23.4—25.4, av. 24.1; length without wings 11.1—12.8, av. 12.0; wingspan 40.3—43.2, av. 41.8; length of forewing 17.8—19.2, av. 18.5; width of forewing 4.89—5.49, av. 5.20; head width including eyes 2.12—2.28, av. 2.21; diameter of eyes 0.62—0.71, av. 0.64; pronotum length along midline 1.17—1.25, av. 1.20; pronotum width 2.23—2.54, av. 2.43.

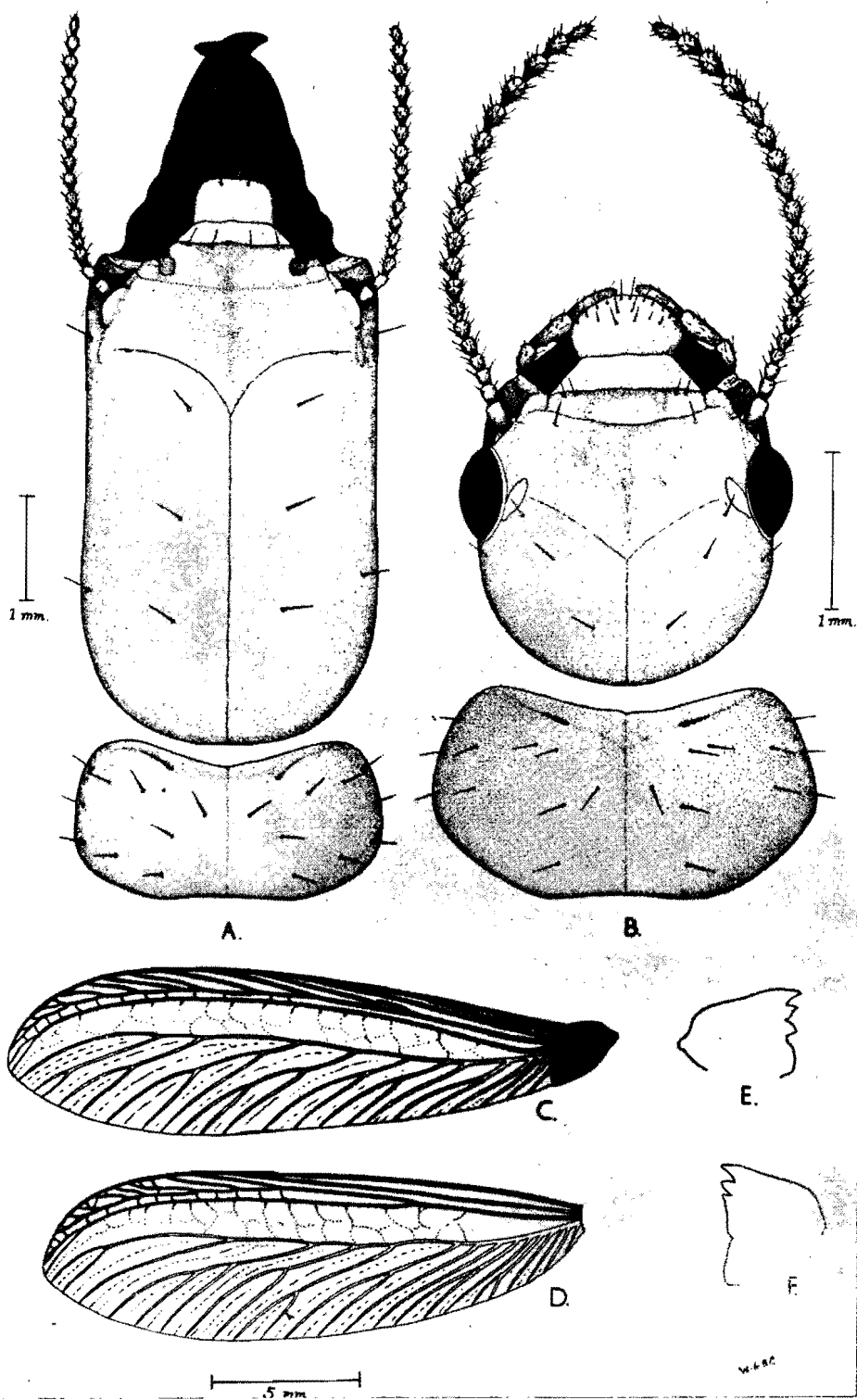
Fig. 2. *Neotermes lepersonneae* sp. nov.

Soldier: A - head and pronotum, dorsal aspect.

Imago: B - head and pronotum, dorsal aspect; C - forewing; D - hindwing;

E - left mandible; F - right mandible.





*Soldier* (Fig. 2, A).

Head yellow-red with darker antennal carinae, Anteclypeus white, labrum, palpi and antennae brown-yellow. Eyes represented by grey-white blotches. Ocelli represented by minute white spots. Mandibles yellow-brown at bases, shading down thereafter to shining black. Gula pale yellow in the middle, bordered on each side by a brown strip; darker in front than behind. Pronotum yellow, much paler than the head, the anterior margin edged with brown. Meso- and metanotum and abdomen cream. Legs cream with brown tibial apical spines and tarsal claws.

Head and thorax sparsely covered with stiff bristles. In dorsal outline the head is elongate rectangular; postero-lateral corners so broadly rounded as to form a semi-circle with the posterior margin; sides straight and parallel, or slightly concave in the middle. Epicranial and transverse sutures distinct, clypeo-frontal suture represented by a transverse depression. Compound eyes rudimentary, not clearly demarcated, unfacetted. Ocelli rudimentary, minute. Frontal area depressed medially, seen from the side dropping from the vertex to the level of the mandibles at an approximate angle of  $30^\circ$ . Anteclypeus with straight sides converging distally, obtusely rounded into a nearly straight anterior margin which is slightly humped in the middle. Labrum with straight, nearly parallel sides, broadly rounded into a practically straight anterior margin; a few stout bristles set along the anterior margin. Gula much wider in the distal third than in the proximal two-thirds, at its narrowest less than half its greatest width.

Antenna with 15—16 articles (of 4 examined, 2 were incomplete, one had 15 and one 16 articles); in the expression with 15 articles, II slightly shorter than III, III more than twice the length of IV with indications of a partial division near the distal end, V slightly shorter than IV; in the expression with 16 articles, II very slightly longer than III, IV distinctly shorter than III and V.

Seen from above the mandibles are flatly humped near the outer bases, the sides thereafter slightly sinuate, and then convexly incurved to the tips; from the side the mandibles are upcurved to the tips. Left mandible with 3 marginal teeth, I narrow-based, II and III wide-based and pointed in the middle. Right mandible with two prominent, angular marginal teeth.

Pronotum with the anterior margin distinctly concave, the antero-lateral corners sub-rectangular and broadly rounded, the sides flatly convex, the postero-lateral corners broadly rounded into a somewhat 3-facetted hind margin, the middle facet of which is slightly concave; arched transversely, about as wide as the head (2.96 cf. 2.95) or distinctly narrower than head width (2.73 cf. 3.00); slightly wider than twice the length along the midline (av. 2.84 cf. 1.31). Meso- and metanotum with vestigial wingbuds, the posterior margin of the mesonotum slightly concave in the middle, that of the metanotum nearly straight.

Tibial apical spines number 3 each in fore-, mid- and hindleg. Cerci short, styli present in both specimens. Pulvilli present.

Measurements (2 specimens only): Total length 13.4—14.2; head length including mandibles 6.70—6.87; head width 2.95—3.00; length of left mandible 2.46—2.54; pronotum length along the midline 1.29—1.33; pronotum width 2.73—2.96.

*Relationship:*

Imago: Readily distinguished owing to its larger wings from *N. agilis* Sjöst., *N. desneuxi* Sjöst., *N. pallidicollis* Sjöst., *N. firmus* Sjöst., *N. meruensis* Sjöst., *N. europae* Wasm., *N. camerunensis* Sjöst., *N. gestri* Silv., *N. laticollis* Hgrn., *N. nigeriensis* Sjöst., *N. aburiensis* Sjöst., *N. sepulvillus* Emers., and *N. zuluensis* Hgrn.: Span 40.3—43.2 cf. 20—34; length of forewing 17.8—19.2 cf. 9.0—15.1; width of forewing 4.9—5.5 cf. 2.6—4.5. The species with wings most closely approximating in size those of *N. lepersonneae* are *meruensis*, *europae*, *gestri*, *laticollis* and *nigeriensis* (wingspan between 32.0 and 34.0; forewing length between 14.0 and 15.1; forewing width between 4.0 and 4.5).

Soldier: Differs from *N. europae* Wasm., *N. gestri* Silv., *N. laticollis* Hgrn., and *N. amplius* Sjöst. in that the eyes are not clearly delimited and are unfaceted. The head of *N. lepersonneae* is longer and wider than that of *N. camerunensis* Sjöst., *N. meruensis* Sjöst., *N. voeltzkowi* Wasm., *N. desneuxi* Sjöst., *N. zuluensis* Hgrn., *N. erythraeus* Silv., *N. aburiensis* Sjöst., and *N. cryptops* Sjöst. (length of head with mandibles 6.7—6.9 cf. 4.5—6.2; head width 2.9—3.0 cf. 2.0—2.5). In head dimensions it is closest to *N. howa* Wasm. (length of head with mandibles 6.7—6.9 cf. 6.5—7.0; head width 2.9—3.0 cf. 2.6—2.9). It can readily be distinguished from *N. howa* by the fact that its mandibles have yellow-brown bases instead of being shining black throughout.

*Distribution:*

Belgian Congo: Mongbwalu (Lepersonne). Type locality.

*Material studied:*

Series Terv. 112: Collected Mme Lepersonne, Mongbwalu, Belgian Congo, —. ix. 1938. Holotype male winged imago, Morphotype soldier and Paratype winged imagos lodged with the Belgian Congo Museum, Tervuren. Paratype soldier and winged imagos lodged with the Division of Entomology, Pretoria.

(iv) *Glyptotermes ueleensis* sp. nov.

*Imago* (Fig. 3, E—I).

Head brown, eyes black, ocelli white. Postclypeus bordered on either side with black-brown and with a median band of a similar colour. Anteclypeus white. Labrum brown-yellow. Antennae tinged a pale brown. Pronotum a somewhat paler brown than the head. Meso- and metanotum somewhat paler than the pronotum, each with a blackish median line in the anterior half which fades away at about midlength. Sternites cream-yellow, tergites darker, of the same colour as the metanotum. Femora brown-yellow, slightly paler than the tibial and tarsi, the tibial apical spines and tarsal claws brown

and contrasting. Wing membrane tinged brown-yellow, all ribs from the costa up to and including the median brown, the cubitus unpigmented.

A few stout bristles scattered over the head and thorax. Seen from above, the sides of the head posterior to the eyes are straight, the postero-lateral corners are very broadly rounded and the posterior margin flatly convex, the total effect being roughly U-shaped. Epicranial, transverse and clypeo-frontal sutures distinct. Eyes prominent, sub-circular in outline. Ocelli oval, nearly but not quite in contact with the upper rims of the eyes. Anteclypeus with nearly straight sides converging distally, rounded into a nearly straight, slightly concave anterior margin. Labrum with convex sides broadly rounded into a nearly straight slightly convex anterior margin.

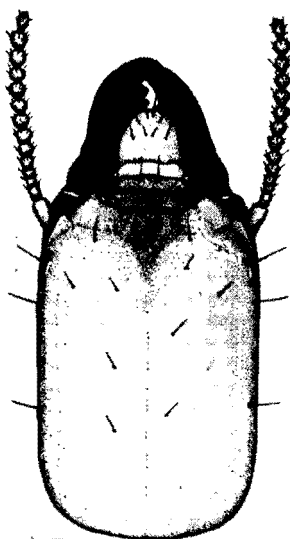
Left mandible with two marginal teeth; I separated from the apical by an acute-angled notch; the angle between I and II obtuse, II pointing backwards. Right mandible with two marginal teeth; I narrow-based, sub-conical, separated from the apical and II by acute-angled notches; II wide-based with the point at the proximal end and a second vestigial point at approximately midlength. Antenna with from 13—14 articles (of 20 examined, 40 % were incomplete, 5 % had 13 and 55 % had 14 articles); I the longest, II shorter than III, III longer than IV.

Pronotum arched transversely, somewhat wider than its length in the middle (the average width and length in 10 specimens examined 0.84 and 0.52 respectively); pronotum narrower than the width of the head including the eyes (average for 10 specimens 0.84 and 0.95 respectively); anterior margin evenly and flatly concave, antero-lateral corners rounded, sub-rectangular, the sides flatly convex and broadly rounded into a posterior margin which is very faintly indented in the middle; the sides and posterior margin together form an approximate semi-circle. The posterior margin of the mesonotum slightly incurved in the middle, that of the metanotum somewhat angularly emarginate in the middle.

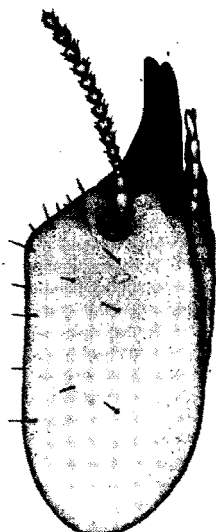
The anterior wing stub more than twice as long as that of the hindwing. Wings with the costal margin, radius, radius sector and median strongly chitinised, the cubitus unchitinised and scarcely differentiated from the wing membrane, which is densely covered with faintly pigmented micrasters. The costal margin fringed with short hairs. Forewing with a short, simple radius, an unbranched radius sector running close to and parallel with the costal margin, a simple median which, after being angled at the base, runs close to and parallel with the radius sector; the cubitus is clearly defined only at its base, thereafter being largely obscured by the micrasters on the membrane of the wing; all the wing ribs arise independently at the wing suture. The description of the forewing applies to the hindwing, with the following dif-

Fig. 3. *Glyptotermes ueleensis* sp. nov.

Soldier: A - head and pronotum, dorsal aspect; B - head, lateral aspect;  
C - gula; D - mandibles.  
Imago: E - head and pronotum, dorsal aspect; F hindwing; G. forewing;  
H - left mandible; I - right mandible.



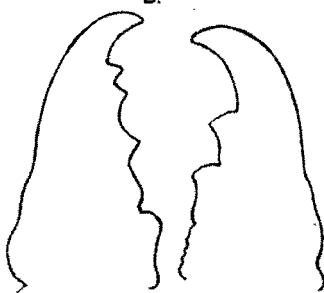
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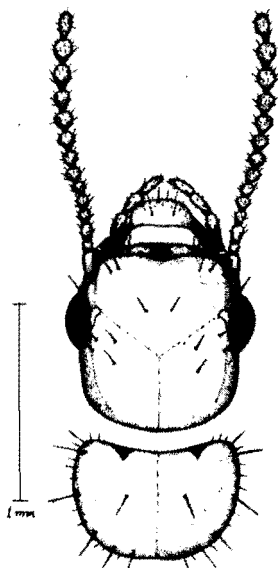
B.



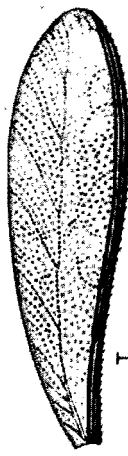
C.



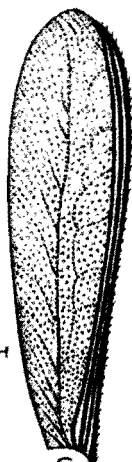
D.



E.



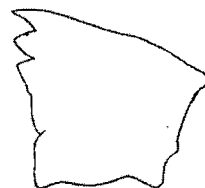
F.



G.



H.



I.

W.H.C.

ference: In the hindwing the radius sector and median have a common stem beyond the suture in the proximal quarter of the wing, and thereafter separate out to run close to and parallel with each other to the wing tip.

Tibial apical spines number three each on fore-, mid-, and hindleg. Cerci short. Styli present on the male, absent on the female. Pulvilli present.

Measurements (3 winged imagos, 7 dealates, of which 6 are males and 4 are females): Length including wings 7.4—8.0, av. 7.7; length without wings 4.3—6.7, av. 5.5; wingspan 12.7—13.1, av. 12.9; forewing length 5.4—5.5, av. 5.4; forewing width 1.37—1.46, av. 1.42; head width including eyes 0.92—0.96, av. 0.95; diameter of eyes 0.21—0.27, av. 0.24; pronotum length along the midline 0.50—0.54, av. 0.52; pronotum width 0.80—0.87, av. 0.84.

*Soldier* (Fig. 3, A—D).

Head posterior to the frontal area brown-yellow, the frontal area dark brown medially and brown-black laterally. Antennal carinae brown tipped with brown-black. Anteclypeus white, labrum brown-yellow. Mandibles black throughout. Antennae cream. Gula brown-yellow, bordered on each side with darker brown. Eyes indicated by greyish blotches posterior to the antennal fossae. Pronotum yellow, slightly paler than the head, the anterior margin edged with brown, and a somewhat triangular brown marking near the anterior margin on each side midway between the antero-lateral corners and the midline; the pronotum on occasions raggedly marked with silvery blotches. Meso- and metanotum, as well as the tergites, cream-yellow, the sternites cream. Legs yellow-cream with contrasting brown tibial apical spines and tarsal claws.

Stiff bristles sparsely set over the head and pronotum. Head elongate rectangular, its length to the tip of the labrum slightly less than twice its width (average for 6 specimens 2.10 and 1.09 respectively); sides practically straight, parallel or converging slightly towards the posterior end, the postero-lateral corners very broadly rounded, the hind margin slightly and convexly curved. Epicranial and transverse sutures faintly delineated, the clypeo-frontal suture represented by a transverse depression. Frons depressed medially, its postero-dorsal margin distinctly bilobed; when the head is viewed from the side, the frons declines to the level of the mandibles at an approximate angle of 45°. Anteclypeus with straight sides converging distally, and a flatly bisinuate anterior margin. Labrum tongue-shaped, slightly wider than long, a few stiff bristles set on its anterior half. Compound eyes vestigial, not clearly delineated, un-faceted, unpigmented. Ocelli so vestigial as to appear entirely lacking.

Mandibles short and stout, roughened in the basal half, thereafter smooth; the outer bases roundly humped, the sides thereafter somewhat sinuate and then evenly and convexly incurved towards the tip; from the side, the mandibles are flatly upcurved towards the tips. Left mandible with three marginal teeth; I narrow-based with rounded or pointed tip; II narrow-based with pointed tip; III wide-based with its point near the distal end. Right mandible with two prominent step-like teeth and a molar plate. Gula markedly con-

stricted in the proximal half, more than twice as wide in the distal half as in the narrowest portion of the basal half. Antenna with from 13—14 articles (of 12 examined, 16.7 % were incomplete, 33.3 % had 13, and 50.0 % had 14 articles); I the longest, II nearly as long as III plus IV; III the smallest slightly shorter and narrower than IV.

Pronotum with flatly concave anterior margin, rounded sub-rectangular antero-lateral corners, the sides slightly convex, nearly straight and parallel, the postero-lateral corners very broadly rounded, the hind margin straight or slightly incurved in the middle; as wide as or slightly narrower than the head (averages for 6 specimens 1.04 and 1.09 respectively), width slightly less than twice the length along the midline (averages for 6 specimens 1.04 and 0.55 respectively). Meso- and metanotum with rudimentary wingbuds, the posterior margin of the mesonotum more distinctly bilobed than that of the metanotum which is nearly straight.

Tibial apical spines number 3 each on fore-, mid- and hindleg. Cerci short. Styli present on all 6 specimens examined.

Measurements (6 specimens): Total length 5.79—6.12, av. 5.91; length of head with mandibles 2.29—2.39, av. 2.35; head width 1.04—1.12, av. 1.09; length of left mandible 0.79—0.83, av. 0.81; pronotum length in the middle 0.54—0.58, av. 0.55; pronotum width 1.03—1.05, av. 1.04.

#### *Relationship:*

Imago: The winged imago of *G. parvulus* Sjöst. is unknown. The forewing of *G. insulanus* Silv. is somewhat longer and wider than that of *G. ueleensis* ( $6.0-7.0 \times 1.65-1.70$  cf.  $5.4-5.5 \times 1.37-1.46$ ).

In their head width the imagos of *G. insulanus*, *G. parvulus* and *G. ueleensis* correspond to a great extent, the respective measurements being 0.92 (Silvestri, 1912, p. 7, gives the figure 9.92 which is an obvious misprint for 0.92), 1.2 (Grassé, 1937, p. 15) and 0.92—0.96. Judging by the drawings of the head and pronotum of *G. insulanus* (Silvestri, 1912, p. 6, fig. II 2) and *G. parvulus* (Grassé, 1937, p. 16, fig. 11), in dorsal perspective (a) the outline of the head posterior to the eyes is semi-circular in these two species, whereas with *G. ueleensis* it is distinctly U-shaped, and (b) *G. ueleensis* corresponds with *G. insulanus* and differs from *G. parvulus* in that the postero-lateral corners of its pronotum are so broadly rounded that the sides and posterior margin together form an even semi-circle.

Soldier: *G. insulanus* and *G. longus* Hgrn. have distinctly longer and wider heads than *G. ueleensis*, the respective measurements being (a) length of head with mandibles, 2.93—3.0 and 3.70 cf. 2.29—2.39, and (b) head width, 1.35—1.40 and 1.40 cf. 1.04—1.12. *G. parvulus* is closest in head dimensions (head length with mandibles 1.95—2.10 cf. 2.29—2.39; head width 0.8—1.12 cf. 1.04—1.12). Judging from the excellent drawing of the soldier of *G. parvulus* given by Grassé (1937, p. 15, fig. 9) the pronotum of this species differs from that of *G. ueleensis* in the following respects: (a) It is shorter along the midline in proportion to its width (width distinctly greater than twice the length, whereas with *ueleensis* the width is less than twice the length).

(b) The sides of the pronotum of *parvulus* are nearly straight and converge markedly towards the hind margin, with the result that the pronotum has a trapezoidal outline. With *ueleensis* the sides are nearly parallel at first and thereafter very broadly rounded into the nearly straight hind margin, the resulting outline being sub-quadrate rather than trapezoidal.

*Distribution:*

Belgian Congo: Uele Forest, Tora: Yebo (Burgeon), Type locality.

*Material studied:*

Series Terv. 78: Collected H. Burgeon, Uele Forest, Tora: Yebo, 14. iii. 1926. Cotype winged imagos, dealates, soldiers lodged with the Belgian Congo Museum, Tervuren, and the Division of Entomology, Pretoria.

(v) ***Cryptotermes havilandi* Sjöstedt.**

1897. Sjöstedt, Y.: *Ent. Tidskr.*, Vol. 18, No. 4, p. 112, imago, Fernando Po, Cameroons, *Calotermes domesticus*, nom. praeoccup.
1900. Sjöstedt, Y.: *K. Svenska Vet. Akad. Handl.*, Vol. 34, No. 4, p. 43, Belgian Congo (Boma), *Calotermes havilandi*.
1904. Sjöstedt, Y.: *K. Svenska Vet. Akad. Handl.*, Vol. 38, No. 4, pp. 9, 18, *Calotermes havilandi*.
1910. Wasmann, E.: *In Voeltzkow, "Reise in Ostafrika", Wiss. Ergeb.*, Vol. 3, No. 2, p. 120, Comoro Isles, *Calotermes havilandi*.
1911. Holmgren, N.: *K. Svenska Vet. Akad. Handl.*, Vol. 46, No. 6, p. 55, *Calotermes (Cryptotermes) havilandi*.
1911. Sjöstedt, Y.: *Ent. Tidskr.*, Vol. 32, Nos. 3-4, p. 137, imago, soldier, Belgian Congo (Mukimungu), *Calotermes lamanianus*.
1914. Silvestri, F.: *Boll. Lab. Zool. Gen. Agr. Portici*, Vol. 9, p. 6, soldier, Nigeria (Olokomeji, Ibadan), Gold Coast (Aburi), *Cryptotermes havilandi*; p. 7, soldier, Senegal (Thiès), *Cryptotermes senegalensis*.
1914. Sjöstedt, Y.: *Arkiv. Zool.*, Vol. 8, No. 27, p. 6, winged imago, Madagascar (Fenerive), *Calotermes havilandi*.
1926. Sjöstedt, Y.: *K. Svenska Vet. Akad. Handl.*, Ser. 3, Vol. 3, No. 1, p. 28, *Cryptotermes lamanianus*; p. 29, additional localities, Belgian Congo (Boma) and Kenya (Mombasa), *Cryptotermes havilandi*.
1937. Grassé, P. P.: *Ann. Soc. Ent. France*, Vol. 116, No. 1, p. 6, imago, soldier Ivory Coast, *Cryptotermes lamanianus*; p. 8, imago, soldier, Senegal (Dakar, Rufisque), *Cryptotermes lamanianus* subsp. *senegalensis*.
1940. Adamson, A. M.: *Trop. Agric.*, Trinidad, Vol. 17, No. 1, p. 13, Trinidad, Tobago (Speyside), *Cryptotermes* sp.
1949. Snyder, T. E.: *Smithsonian Miscell. Collections*, Vol. 112, p. 42, synonymy, *Cryptotermes havilandi*.
1950. Coaton, W. G. H.: *J. Ent. Soc. So. Afric.*, Vol. 13, p. 12, imago, soldier, Zululand (Dukuduku Forest, Mkuzi Reserve, Maputa), *Cryptotermes havilandi*.
1951. Harris, W. V.: *Proc. Royal Ent. Soc.*, London, Ser. B., Vol. 20, Pts. 1-2, p. 25, Tanganyika (Dar es Salaam), *Cryptotermes havilandi*.



Sjöstedt (1897), using as Cotypes only the alate caste, collected at Victoria (Cameroons), described the new species *Calotermes domesticus*. Since this name was preoccupied, he renamed it *havilandi* in 1900. Subsequently (1911) Sjöstedt described as a new species a dealate and soldier series from Mukimbungu (Belgian Congo) which he named *Calotermes lamanianus*.

In 1914 Silvestri identified with *havilandi* Sjöstedt soldiers and alates collected at Ibadan and Olokomeji (Nigeria) and an alate series from Aburi (Gold Coast). He placed the species in the genus *Cryptotermes*, and described the soldier caste for the first time. In the same publication he described a new species, close to *lamanianus* Sjöst., which he named *Cryptotermes senegalensis*, using as Cotypes a series of soldiers collected at Thiès (Senegal).

Sjöstedt (1926) separated the soldiers of *C. laminianus* into major and minor castes, and placed *senegalensis* in synonymy with this species on the grounds that he found one of Silvestri's Cotype soldiers of *senegalensis* examined by him to be identical with the minor soldier of *lamanianus*, both in respect of morphological features and size.

Grassé (1937) determined as *lamanianus* a series of *Cryptotermes* collected at various localities on the Ivory Coast, gave an excellent description of the winged imago of this species for the first time, and redescribed the soldier caste. In the same publication he determined as *Cryptotermes lamanianus* subsp. *senegalensis* Silv. a series of soldiers and alates collected at Dakar and Rufisque (Senegal).

Snyder (1949) placed both *senegalensis* and *lamanianus* in synonymy with *Cryptotermes havilandi* Sjöst. After having examined a large series of winged imagos and soldiers of *C. havilandi* collected at various localities in Zululand (Union of South Africa), the writer has no hesitation in following Snyder. The criteria used to separate *senegalensis* and *lamanianus* from *havilandi* in respect of both the imago and soldier castes, whether morphological or dimensional, appear to have neither specific nor subspecific significance since forms intergrading between the extremes can be found. It is clear that *C. havilandi* is a widely distributed species which varies considerably, especially in the case of the soldier caste.

	Central Africa	South Africa	Range
Wingspan	15.0—17.0	15.6 —17.0	15.0 —17.0
Forewing length	6.5— 7.4	6.8 — 7.7	6.5 — 7.7
Forewing width	1.7— 2.0	1.87— 2.12	1.7 — 2.1
Body length plus wings	8.5—10.2	9.3 —10.1	8.5 —10.2
Body length minus wings	5.0— 6.5	5.0 — 6.0	5.0 — 6.5
Antenna	15—16 arts.	14—17 arts.	14—17 arts.

TABLE 3.

*C. havilandi*: Comparison of imagos from Central and Southern Africa.

Published data in respect of antennal articulation and the dimensional range of the alate of *C. havilandi* (Sjöstedt: Cameroons and Fernando Po) are combined with the corresponding data in respect of its described variations *lamanianus* (Grassé: Ivory Coast) and *senegalensis* (Grassé: Senegal), and compared in Table 3 with corresponding data in respect of the Zululand series of *havilandi* (Coaton: South Africa).

In the antennal articulation and dimensional range of the winged imago it will be noticed that the Zululand series to a very great extent embrace the Central African representatives of the species and its variations.

Published data in respect of antennal articulation and the dimensional range of the soldier of *C. havilandi* (Silvestri: Nigeria) are combined with the corresponding data in respect of its described variations *lamanianus* (Sjöstedt: Belgian Congo and Senegal; Grassé: Ivory Coast) and *senegalensis* (Silvestri and Grassé: Senegal), and compared in Table 4 with the corresponding data in respect of the Zululand series of *havilandi* (Coaton: Union of South Africa).

	Central Africa	South Africa	Range
Length	4.6 —5.6	3.62—6.29	3.62—6.29
Length of head with mandibles	1.57—1.90	1.58—1.96	1.57—1.96
Head width	1.20—1.46	1.08—1.35	1.08—1.46
Length of mandible	0.58—0.75	0.62—0.79	0.58—0.79
Antenna	11—14 arts.	11—14 arts.	11—14 arts.

TABLE 4.

*C. havilandi*: Comparison of soldiers from Central and South Africa.

It will be noticed to how great an extent the range of the South African soldier series embraces that of the Central African representatives of the species with its described variations.

There lies before me a winged imago from Leopoldville which corresponds very closely with the description of the imago of *C. havilandi* from Zululand (Coaton 1950). Its measurements follow, the dimensions of the Zululand series being given in parenthesis: Wingspan 15.9 (15.6—17.0); forewing length to the suture 6.8 (6.8—7.7); forewing width 2.02 (1.87—2.12); body length with wings 9.6 (9.3—10.1); body length without the wings 4.83 (4.98—6.04); head width 1.00 (0.96—1.02); diameter of eyes 0.29 (0.27—0.31); pronotum length at the midline 0.60 (0.54—0.60); pronotum width 1.00 (0.87—1.04). There need be no hesitation in determining this imago as *C. havilandi*.

#### *Distribution:*

Cameroons: Victoria (Buchholz), Type locality; Fernando Po (Buchholz);

Nigeria: Olokomeji, Ibadan (Silvestri); Gold Coast: Aburi (Silvestri); Senegal: Thiès (Silvestri), Dakar and Rufisque (Grassé); Ivory Coast (Grassé); Belgian Congo: Mukimbungu (Laman), Boma (Hagemann), Leopoldville (Heurard); Kenya: Mombasa (Lovén); Tanganyika: Dar es Salaam (Harris); Madagascar: Fenerive (Kaudern); Comoro Islands (Wasmann); Union of South Africa — Zululand: Dukuduku Forest (Geyer), Mkuzi Reserve (Naudé), Lower Mkuzi Drift (Fuller), Maputa (Coaton); West Indies (introduced): Trinidad and Tobago (Adamson).

*Material studied:*

Terv. 266: Unique imago, collected Heurard, Leopoldville, 1936, lodged with the Belgian Congo Museum, Tervuren. F. 1338, F. 1397, F. 1399, TM. 771, TM. 856, TM. 855 from Zululand, lodged with the Division of Entomology, Pretoria.

(vi) ***Thoracotermes macrothorax* Sjöstedt.**

1899. Sjöstedt, Y.: *Ent. Nachr.*, Jahrg. 25, Nos. 3-4, p. 38, soldier, worker, Cameroon (Lolodorf), *Eutermes macrothorax*.
1900. Sjöstedt, Y.: *K. Svenska Vet. Akad. Handl.*, Vol. 34, No. 4, pp. 74, 153, soldier, worker, Cameroon, Gold Coast, (Aburi), *Eutermes macrothorax*.
1904. Sjöstedt, Y.: *K. Svenska Vet. Akad. Handl.*, Vol. 38, No. 4, pp. 34, 47, 78, soldier, worker, Cameroon, Gold Coast, *Eutermes macrothorax*.
1905. Sjöstedt, Y.: *Arkiv. Zool.*, Vol. 2, No. 16, p. 9, queen, Belgian Congo, *Eutermes macrothorax*.
1911. Wasmann, E.: *Rev. Zool. Afric.*, Vol. 1, Nos. 1-2, p. 146, alate queen, soldier, worker, Cameroon (Mundame), Belgian Congo (Sankuru), *Thoracotermes* ("*Eutermes*") *macrothorax*.
1912. Holmgren, N.: *K. Svenska Vet. Akad. Handl.*, Vol. 48, No. 4, pp. 97, 98, imago, soldier, Cameroon, Belgian Congo, *Thoracotermes macrothorax*.
1913. Sjöstedt, Y.: *Rev. Zool. Afric.*, Vol. 2, No. 3, p. 386, alate, queen, Belgian Congo (Mukimbungu, Kasai, Kondue), *Eutermes* (*Thoracotermes*) *macrothorax*.
1914. Silvestri, F.: *Boll. Lab. Zool. Gen. Agr. Portici*, Vol. 9, p. 82, Gold Coast (Aburi), S. Nigeria (Yaba: Lagos), *Thoracotermes macrothorax*.
1926. Sjöstedt, Y.: *K. Svenska Vet. Akad. Handl.*, Vol. 3, No. 1, p. 211, alate, queen, soldier, worker, French Equatorial Africa, Gold Coast, S. Nigeria, Cameroon, Belgian Congo, *Thoracotermes macrothorax*.
1926. Sjöstedt, Y.: *Arkiv. Zool.*, Vol. 18B, No. 12, p. 4, Gold Coast, *Thoracotermes macrothorax*.
1928. Emerson, A. E.: *Bull. Amer. Mus. Nat. Hist.*, Vol. 57, Art. 7, p. 500, soldier, Cameroon (Bipindi, Senegambina), Belgian Congo (Stanleyville), *Thoracotermes macrothorax*.
1949. Snyder, T. E.: *Smithsonian Misc. Coll.*, Vol. 112, p. 153, synonymy, localities, *Thoracotermes macrothorax*.

There lies before me a termite series consisting of a dealated male imago and a large number of soldiers taken from a three-roofed pagoda-like mound

at Stanleyville, Belgian Congo. This series, a description of which follows, is referred to the species *T. macrothorax* Sjöst.

*Dealate male imago* (Fig. 4, G—H).

Head dark chestnut, postclypeus somewhat paler, anteclypeus transparent white with an opaque white medial stripe; labrum gold-yellow, antennal segments ringed with light brown, compound eyes black with pale rims, ocelli white. Pronotum chestnut, of about the same colour as the head, the meso- and metanotum a somewhat paler brown. Tergites chestnut, sternites a paler brown. Legs pale brown-yellow, the tibiae somewhat darker than the femora and tarsi.

The head, thorax, wing stubs and abdomen densely covered with fine hairs and a smaller number of stouter bristles.

Epicranial and transverse sutures present on the head but indistinct owing to the dark colour of the head, clypeo-frontal suture distinct. Fontanelle present but indistinct owing to the dark colour of the head. Compound eyes prominent, sub-circular in outline. Ocelli sub-circular, directed antero-laterally, removed from the upper rims of the eyes by a little less than their diameter (3 : 4). Postclypeus inflated, the posterior margin angularly convex, two-faceted; the sides straight and converging distally, the antero-lateral corners rounded, obtuse-angled, the anterior margin straight; length along the midline approximately equal to half its width. Anterior margin of the anteclypeus two-faceted, peaked in the middle. Labrum with diverging sides broadly rounded into a somewhat three-faceted, convex anterior margin. Antenna incomplete on both sides; I the longest article, approximately as long as II plus III plus IV; II somewhat longer than III, III slightly shorter than IV, III and IV the shortest articles.

Pronotum sub-trapezoidal in outline; the anterior margin nearly straight but slightly concave, hardly perceptibly incised in the middle; antero-lateral corners sub-rectangular, rounded; the slightly convex sides converging towards and broadly rounded into the hind margin; the hind margin barely perceptibly angularly emarginate; the triangular anterior lobe bent upwards; pronotum slightly narrower than the head width including the eyes (34 : 38), about 1.6 times as wide as the length along the midline. Posterior margin of the mesonotum roundly concave, that of the metanotum almost rectangularly emarginate. The anterior wing stubs distinctly wider than those of the hindwings (width along suture edge 21 : 17).

Styli present but vestigial.

Measurements: Total length 7.63; head width, including the eyes, 1.58; diameter of eyes excluding the rims 0.375, including the rims 0.416; diameter of ocellus 0.166; pronotum length along the mid-line 0.875; pronotum width 1.42.

*Soldier* (Fig. 4, A—F).

Head brown-yellow to red-yellow, the antennal carinae edged with brown; from the dorsal aspect the position of the fontanelle is indicated by a short,

transverse dark brown line; postclypeus slightly darker than the rest of the head; anteclypeus transparent white at the tip, brown-yellow at the base due to the colour of the underlying mandibular bases. Labrum colourless and transparent over the basal half, the distal half pale yellow. Antennae brown-yellow. Mandibles yellow-brown at bases, thereafter shading down to brown-black or shining black. Ventral genae bright cream-yellow, gula gold-yellow edged laterally with brown-yellow in the narrowed proximal section. Pronotum cream-yellow, somewhat paler than the head, meso- and metanotum cream-yellow. Tergites and sternites cream-yellow, the black-grey alimentary tract showing through. Legs cream with brown tibial apical spines and tarsal claws. Excepting the appendages of the head and thorax, and the last segment of the abdomen, the head and body of the soldier are smooth and hairless.

Head sub-rectangular, the sides converging markedly only distal to the antennal attachment, usually very slightly incurved just distal to the postero-lateral corners; postero-lateral corners broadly rounded, the hind margin convex, with the result that the head has a U-shaped outline when viewed from above. Epicranial and transverse sutures not visible, clypeo-frontal suture distinct. Eyes and ocelli lacking. The large pear-shaped frontal gland is clearly demarcated on the vertex. Frons depressed. Postclypeus with flatly convex posterior margin, the anterior margin peaked in the middle, two-faceted. Anteclypeus with sides converging distally, the anterior margin two-faceted, peaked in the middle. Labrum with sides first convex proximally then straight and nearly parallel, the antero-lateral corners obtusely rounded, the anterior margin two-faceted, peaked in the middle; with stout bristles set along the distal end; a groove runs longitudinally to the tip along the midline. From the side, the dorsal profile of the head is straight, the vertex above the fontanelle is rounded and does not completely overhang the fontanelle, which is surrounded by hairs; the frontal area declines steeply at an approximate angle of  $45^{\circ}$  to the level of the mandibles; the mandibles are upcurved towards the tip. From its constricted proximal end, the sides of the gula diverge markedly, then converge, thus forming a sharp peak on each side near the distal end; the anterior margin is very flatly concave; greatest width: narrowest width :: 20 : 7.

Mandibles long and stout, the outer sides fairly straight, markedly incurved only near the tips. Left mandible with a prominent, upwardly-directed, pointed tooth at the base, and just distal to it a less prominent, rounded, pointless tooth; the cutting margin thereafter with a few minor serrations, then smooth to the tip. Right mandible with a small but distinct step-like tooth near the base, and below it a minute thornlike tooth; the rest of the cutting margin smooth.

Antenna with 15 articles (of 40 examined, 6 were incomplete and 34 had 15 articles); I the longest; II distinctly longer and wider than III; III the shortest article, slightly shorter than IV; IV distinctly shorter than V.

Pronotum somewhat saddle-shaped, the anterior lobe strongly up-bent, a wide margin along the sides flattened; the anterior margin notched in the middle, somewhat bilobed; antero-lateral corners broadly rounded; sides convex or nearly straight, and strongly converging towards the posterior margin; postero-lateral corners rounded, obtuse-angled; hind margin concave; pronotum

only slightly narrower than the head (in 20 specimens examined, the head width ranged from 1.03 to 1.13 times that of the pronotum, on an average being 1.08 times wider); pronotum about 3 times as wide as its length along its midline (average for 20 specimens examined, 2.11 cf. 0.71). Mesonotum much narrower than the pronotum, metanotum wider than the mesonotum (pronotum: mesonotum: metanotum :: 52 : 31 : 39).

Cerci short. Styli present but vestigial. Tibial apical spines number 3 on the foreleg, with 2 on each of the mid- and hindlegs.

Measurements (20 specimens): Total length 8.79—10.49, av. 9.76; head length including mandibles, 4.37—4.75, av. 4.61; head width, 2.21—2.33, av. 2.29; length of left mandible, 1.69—1.79, av. 1.73, pronotum length along the mid-line, 0.67—0.75, av. 0.71; pronotum width, 2.00—2.23, av. 2.21.

#### *Relationship:*

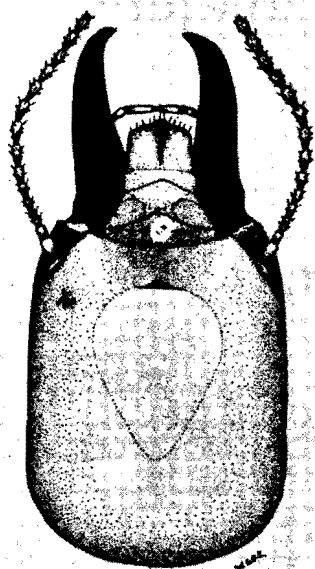
Imago: The dealate male imago described above corresponds well in respect of head and thorax with the description given by Sjöstedt (1905, p. 16) of the queen of *T. macrothorax* collected by Buchholz at Aburi on the Gold Coast. Soldier: The soldiers of *T. macrothorax* from Cameroon and Belgian Congo described by Emerson (1928, p. 500), and from Cameroon and the Gold Coast as described by Sjöstedt (1900, p. 154) appear to be somewhat larger than the series from Stanleyville described above, as the following comparison will show: Head length with mandibles 4.7—5.0 cf. 4.37—4.75; head width 2.78 cf. 2.21—2.23; pronotum length 0.85 cf. 0.67—0.75; pronotum width 2.23 cf. 2.00—2.23; length of mandible 1.7—2.0 cf. 1.69—1.79 (Emerson gives for this measurement 1.08 but judging by the proportions of the mandible in relation to the head width in his figure this is a misprint for 1.88). In other respects the descriptions coincide fairly well. The writer sent a few soldiers of the Stanleyville series to Prof. Emerson for comparison, and by letter received the following opinion:

"I received a Paratype from the Type colony of *T. macrothorax* a few days ago and made a direct comparison. The Paratype soldier is a little larger than your specimens, has a wider pronotum, and the mandibles are a bit more prolonged at the tip. However, I have a great deal of material ranging from Liberia and the Gold Coast through Cameroon, and much of my own collecting in the Belgian Congo. I have 9 vials, with several queens, from various forests of the Congo, all of them conforming well to your specimens, but I also have material collected by others from the Congo that show gradations into the shapes and proportions of the Paratype specimen. In my opinion your series is *T. macrothorax*."

It is clear that the soldier of this species varies considerably, but the variations have neither specific nor subspecific significance.

Fig. 4. *Thoracotermes macrothorax* Sjöst.

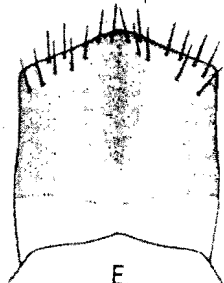
Soldier: A - head and thorax, dorsal aspect; B - another dorsal aspect of the pronotum; C - head, lateral aspect; D - gula; E - labrum; F - mandibles.  
Imago: G - head and pronotum, dorsal aspect; H - (above), hind margin of mesonotum, (below), hind margin of metanotum.



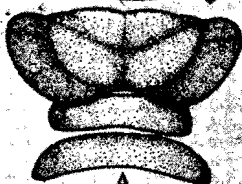
2  
1  
mm.



D.



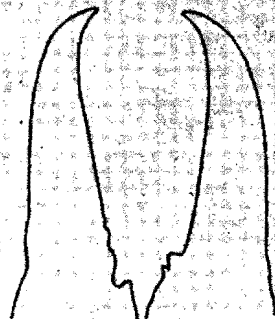
E.



A.



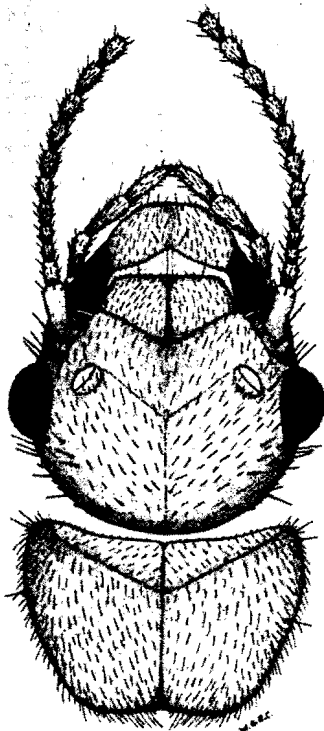
B.



F.



H.



2  
1  
mm.

G.

*Distribution:*

Cameroon: Lolodorf, Type locality (Conradt), Mundame (Conradt), Senegambina (Evans), Bipindi (Zenker); Gold Coast: Aburi (Buchholz, Silvestri, Patterson); Nigeria: Yaba, Lagos (Silvestri); French Equatorial Africa: Indo (Unsgaard); Liberia (Silvestri); Belgian Congo: Kamaiembi, Makesia (Schoutenden), Lukula (Bequaert), Mukimbungu (Laman), Kondui, Kasai, Sankuru (Luja), Stanleyville (Kohl, Poll).

*Material studied:*

Terv. 506: Dealate male imago, soldiers, collected Dr. M. Poll, 1. viii. 1947, Stanleyville, Belgian Congo. Imago and soldier series lodged with the Belgian Congo Museum, Tervuren; a series of soldiers retained by the Division of Entomology, Pretoria.

(vii) **Noditermes cristifrons** Wasmann.

1911. Wasmann, E.: *Rev. Zool. Afr.*, Vol. 1, Nos. 1-2, pp. 151, 153-154, soldier, worker, queen, king, Belgian Congo (Sankuru), *Cubitermes cristifrons*.
1912. Holmgren, N.: *K. Svenska Vet. Akad. Handl.*, Vol. 48, No. 4, p. 108, *Mirotermes (Cubitermes) cristifrons*.
1913. Sjöstedt, Y.: *Rev. Zool. Afric.*, Vol. 2, No. 3, p. 376, soldier, *Eutermes (Cubitermes) cristifrons*.
1926. Sjöstedt, Y.: *K. Svenska. Vet. Akad. Handl.*, Vol. 3, No. 1, pp. 260, 261, 262, winged imago, soldier, Belgian Congo (Mayumbe, Makaia Ntete, Basongo, Luluabourg, Barumb), *Noditermes cristifrons*.
1928. Emerson, A. E.: *Bull. Amer. Mus. Nat. Hist.*, Vol. 57, Art. 7, p. 533, dealate imago, soldier, Cameroon (Bipindi), *Mirotermes (Procubitermes) wasmanni*.
1949. Snyder, T. E.: *Smithsonian Misc. Coll.*, Vol. 112, p. 169, *Procubitermes wasmanni*, p. 170, *Noditermes cristifrons*.

A series of soldiers and workers collected by Dr. M. Poll between Stanleyville and Irumu, Belgian Congo, are referred to *N. cristifrons*, and a redescription of the soldier caste is given below.

*Soldier* (Fig. 5, A—F).

Head cream-yellow up to the posterior margin of the frons, the frontal area a slightly darker brown-yellow. Anteclypeus colourless, transparent. Labrum with a transparent base, thereafter tinged pale yellow. Ventral genae cream-yellow, the gula somewhat darker brown-yellow; anterior margin and sides of the gular projection edged with brown when viewed from below. Mandibles yellow-brown at the bases shading down thereafter to a dark brown-black. Antennae with the first article brown-yellow, the remaining articles pale yellow. Pronotum cream-white, much paler than the head, the rest of the thorax and abdomen white. Legs white, with minute brown tibial apical spines and brown-tipped tarsal claws.

Head sub-rectangular in dorsal outline, sparsely set with stiff bristles,



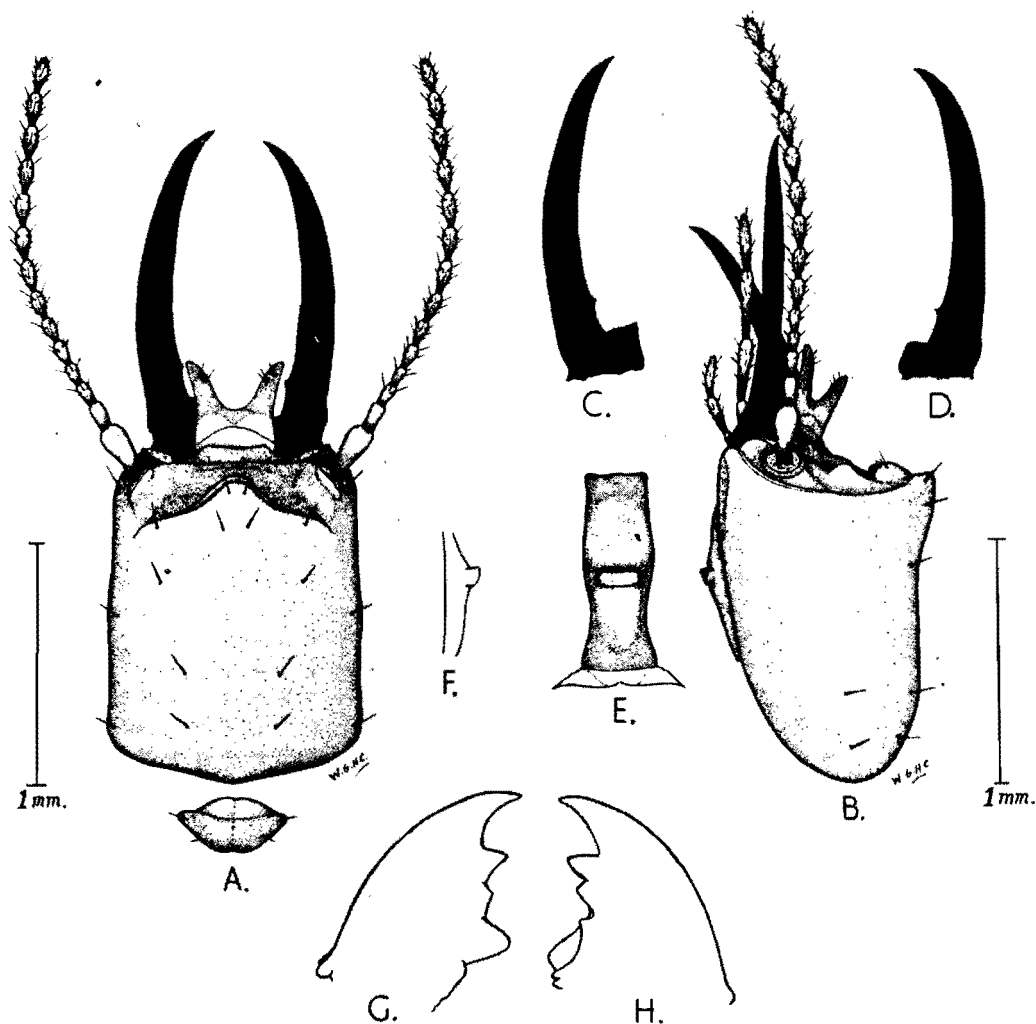


Fig. 5. *Noditermes cristifrons* Wasm.

Soldier: A - head and pronotum, dorsal aspect; B - head, lateral aspect;  
C - left mandible; D - right mandible; E - gula, ventral aspect;  
F - gula, lateral aspect.

Worker: G - left mandible; H - right mandible.

the sides slightly sinuate — humped opposite the antennal bases, at mid-length and at the postero-lateral corners; postero-lateral corners broadly rounded, the posterior margin flatly convex, somewhat two-faceted and humped in the middle. Epicranial and transverse sutures not apparent, clypeo-frontal suture faintly demarcated. Frontal area precipitously declined, the postero-dorsal rim roundly humped in the middle and flatly concave laterally in dorsal perspective. Anteclypeus with convexly curved anterior margin. Labrum furcate, the sides at first straight and nearly parallel, then diverging anteriorly, with a deeply concave anterior margin, each prong with 3 short setae set along the inner margin near the tip. Mandibles finely striated; from above with flatly convex sides incurved towards the tips, each with a minute pointed marginal tooth set slightly above the basal projection; basal projection of the left mandible with a sharply pointed tip, that of the right mandible with a rounded tip. Antenna with 14 articles (of 12 examined, 1 was incomplete and 11 had 14 articles); I with granulated surface, markedly narrowed towards the base, only slightly shorter than the combined lengths of II, III and IV; II only slightly longer than III, III slightly longer than IV, IV slightly shorter than V which is about as long as III.

Viewed from the side, the dorsal profile of the head is distinctly elevated towards the dorsal rim of the frons; the frons drops vertically from the dorsal rim for a short distance, and is then roundly inflated to overhang the depression in which the fontanelle, surrounded by fine hairs, is situated.

In plan the gula has a nearly straight bisinuate anterior margin, rounded sub-rectangular antero-lateral corners, and sides which are convex in the vicinity of the gular projection and concave posterior to it; the gular projection in plan appears sub-rectangular. Viewed from the side, the gula is triangular with the projection at approximately midlength; the gular projection is prominent, with a vertical drop along the anterior margin and a less precipitous drop along the posterior margin.

Pronotum sellate, sparsely set with dark bristles; both anterior and posterior margins are slightly emarginate in the middle; antero-lateral corners rounded, acute-angled, the sides straight and markedly converging on the posterior margin, the postero-lateral corners obtuse and broadly rounded; pronotum width less than half that of the head (average for 6 specimens 0.47 and 1.07 respectively), about twice as wide as long (average for 6 specimens 0.47 and 0.23 respectively).

Abdomen sparsely bristled, dorsally and ventrally. Cerci short, styli lacking. Tibial apical spines very short, numbering 3 on the foreleg, 4 on the midleg and 2 or 3 on the hindleg.

Measurements (6 specimens): Total length 4.87—5.48, av. 5.30; head length including mandibles 2.69—2.81, av. 2.71; head length to tip of labrum 1.71—1.85, av. 1.76; head length to the mid-dorsal rim of the frontal area 1.21—1.29, av. 1.26; left mandible 1.35—1.41, av. 1.37; head width 1.06—1.08, av. 1.07; pronotum length along the mid-line 0.21—0.25, av. 0.23; pronotum width 0.46—0.50, av. 0.47.

The writer sent a soldier specimen from this series to Dr. Emerson for comparison, and received the following opinion:

"Your specimen conforms well to my material from the Congo that I consider to be *Noditermes cristifrons* (Wasmann). I have placed my own name, *wasmanni*, in synonymy with *cristifrons* also. I have a single Cotype of Wasmann's. Your specimen has a slightly wider head than the Cotype soldier, but is otherwise identical. The variation of this species is also fairly large, but again shows no geographical or ecological consistency. Again I have much material with reproductives, alates and soldiers in 31 vials, 12 of which contain queens".

In Table 5 a comparison is made of the dimensions of one of Wasmann's Cotype soldiers given by Sjöstedt (1913, p. 374), Cotype soldiers of *wasmanni* as described by Emerson (1928, p. 533), and the soldier series described above. The dimensional range for the species, including the described variations, is given.

	Sjöstedt	Emerson	This series	Range
Head length with mandibles	2.50	2.60	2.69—2.81	2.50—2.81
Head width	0.98	1.10	1.06—1.08	0.98—1.10
Length of the mandible	—	1.50	1.35—1.41	1.35—1.50
Pronotum length at the mid-line	—	0.25	0.21—0.25	0.21—0.25
Pronotum width	—	0.55	0.46—0.50	0.46—0.55

TABLE 5.

*N. cristifrons*: Dimensions of soldier.

#### Distribution:

Belgian Congo: Sankuru, Type locality, (Luja), Mayumbe, Makaia Ntete, Basongo (Schoutenden), Luluabourg (Callewaert), Barumb (Bequaert), Stanleyville (Schmitz, Poll); Cameroon: Bipindi (Zenker).

#### Material studied:

Terv. 507: Soldiers and workers, collected Dr. M. Poll, Stanleyville area 70 Km. from Irumu, Belgian Congo, 3. iii. 1947. Material divided between the Belgian Congo Museum, Tervuren and the Division of Entomology, Pretoria.

### 3. SUMMARY.

The following species are described as new:

*Neotermes collarti* (unique imago, collected by Collart: Ituri, Forêt de Kawa, Belgian Congo).

*Neotermes lepersonneae* (20 imagos, 2 soldiers, collected by Mme. Lepersonne: Mongbwalu, Belgian Congo).

*Glyptotermes ueleensis* (10 imagos, 6 soldiers, collected by Burgeon: Uele Forest, Tora: Yebo, Belgian Congo).

The following species are redescribed, with notes in each case on synonymy and distribution:

*Neotermes aburiensis* Sjöst. (4 soldiers, collected by Collart. Forêt de Kawa, Lake Albert, Belgian Congo).

*Cryptotermes havilandi* Sjöst. (One imago, collected by Heurard, Leopoldville, Belgian Congo).

*Thoracotermes macrothorax* Sjöst. (Dealate male imago, 20 soldiers, collected by Dr. M. Poll, Stanleyville, Belgian Congo).

*Noditermes cristifrons* Wasm. (6 soldiers and workers, collected by Dr. M. Poll, Stanleyville area 70 Km. from Irumu, Belgian Congo).